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EXAMINER	
RASHID, DAVID	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.**	**Applicant(s)**	
	10/533,385	PARK ET AL.	
	Examiner	**Art Unit**	
	DAVID P. RASHID	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

4a) Of the above claim(s) *1-20 and 39-41* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 April 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Table of Contents

General Information Matter

[1] Please note, the instant Non-Provisional application (i.e., 10/533385) under prosecution at the United States Patent and Trademark Office (i.e., USPTO) has been assigned to Art Unit 2624. Please ensure, to aid in correlating any papers for 10/533385, all further correspondence regarding the instant application should be directed to Art Unit 2624.

[2] 10/533385 has been assigned to David Rashid in the Art Unit 2624 at the USPTO. To aid in correlating any papers for 10/533385, all further correspondence regarding the instant application should be directed to Examiner David Rashid in Art Unit 2624.

Amendments & Claim Status

[3] This office action is responsive to the Supplemental Amendment and Response to Office Action received on Oct. 15, 2008. Claims 21-38 remain pending; claims 1-20 and 39-41 withdrawn.

Priority

[4] Receipt is acknowledged of papers submitted under 35 U.S.C. § 119(a)-(d) (App. No. 2002-0067299, filed Apr. 28, 2005; and App. No. 2003-002074, filed Apr. 28, 2005; and), which papers have been placed of record in the file.

Election/Restrictions

[5] Applicant's election of claims 21-38 in the reply filed on Oct. 15, 2008 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election <u>without traverse</u>. *See* M.P.E.P. § 818.03(a).

Claim 1-20 and 39-41 are withdrawn from further consideration pursuant to 37 C.F.R. § 1.142(b) as being drawn to a nonelected invention/species, there being no allowable generic or linking claim.

Claim Objections

[6] The following is a quotation of the first paragraph of 37 C.F.R. § 1.75(b):

> More than one claim may be presented provided they differ substantially from each other and are not unduly multiplied.

<u>*Duplicate Claims*</u>

Applicant is advised that should claims 33-34, and 37 be found allowable, claims 35-36, and 38 will be objected to under 37 C.F.R. § 1.75 as being a <u>substantial duplicate</u> thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. *See* M.P.E.P. § 706.03(k).

Claim Rejections - 35 USC § 101

[7] 35 U.S.C. § 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Judicial Exception – Abstract Idea

[8] **Claims 21-38** are rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter.

A judicial exception claim is non-statutory for solely embodying an abstract idea, natural phenomenon, or law of nature. *See* M.P.E.P. § 2106(IV)(C)(2). However, a practical application of a judicial exception claim is a § 101 statutory claim "when it:

(A) 'transforms' an article or physical object to a different state or thing [(*i.e.*, a physical transformation, see below)]; or

(B) otherwise produces a useful, concrete and tangible result, based on the factors discussed below. . . ." *Id.*

§ 101 statutory transformations of intangible articles or physical objects must be physical transformations (*i.e.*, a physical component to the transformation must be involved). [1]

In Re Bilski – "Tied To" Criteria

[9] In addition with respect to **claims 21-38**, while the claims recite a series of steps or acts to be performed, a statutory "process" under 35 U.S.C. § 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing.[2]

While the instant claims recite a series of steps or acts to be performed, the claims neither transform underlying subject matter not positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process.

Claim Rejections - 35 USC § 112

[10] The following is a quotation of the second paragraph of 35 U.S.C. § 112:

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[1] *See* M.P.E.P. § 2106(IV)(C)(2) (requiring the element "provides a transformation or reduction of an article to a different state of thing", a "practical application by physical transformation") *and* Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility, Official Gazette notice, 22 November 2005, Annex (II)(B)(iii); (III).

[2] *See* Clarification of "Processes" under 35 U.S.C. 101, Deputy Commissioner for Patent Examining Policy, John J. Love, May 15, 2008; *available at*

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Failure to Particularly Point Out and Distinctly Claim

[11] **Claims 21-38** are rejected under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(i) Any use of a specific number followed by "number of" is confusing, for example – "spatial distribution of 5 number of references edges" at claim 21, line 8 should be changed to "spatial distribution of 5 ~~number of~~ references edges". It is suggested to change all such phrases throughout claims 21-38.

(ii) **Claims 27** and **37-38** fail to distinctly claim the mathematical formulas they embody (e.g., claim 27 contains exclamation points that should be "summation" symbols).

Indefiniteness

Indefiniteness

Claim 21, line 20 (emphasis added) cites "retrieving at least one video sequence similar to the query video sequence based on the comparison results" but there is no definite degree to how "similar" the video sequence must be.

Lack of Antecedent Basis

[12] **Claims 21-38** recite the limitations

"the digital video data" at claim 21, line 2;

"the M edge histogram bins" at claim 24, line 9; and

"the. . .target video sequence" at claim 29, line 2.

There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 U.S.C. § 102

[13] The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

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http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/section_101_05_15_2008.pdf *and In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Park et al.

[14] **Claims 21-24** are rejected under 35 U.S.C. § 102(b) as being anticipated by Efficient Use of Local Edge Histogram Descriptor, Proceedings ACM Multimedia 2000 Workshops, 11/4/2000, ACM International Multimedia Conference (hereinafter "Park et al.").

Regarding **claim 21**, *Park et al.* discloses a method

for retrieving a corresponding video sequence ("MPEG-7" at s. 5, p. 53) having a set of image frames ("11639 images" at s. 5, p. 53) of the digital video data ("MPEG-7" at s. 5, p. 53) in response to a query video sequence ("query images" at s. 5, p. 53) based on a database ("database" at s. 5, p. 53), [*intended use; see M.P.E.P. § 2111.02(II)*]

the method comprising the steps of:

a) calculating L number of representative edge histograms ("edge histogram" at s. 2.2, p. 52; e.g., L being 80 / 5 = 16 as calculated from table 1) of the query video sequence ("query images" at s. 5, p. 53) as an image descriptor ("edge histogram descriptor" at s. 2.2, p. 52) for the query video sequence, wherein each representative edge histogram represents a representative spatial distribution of 5 number of reference edges (fig. 2a-e) in sub-images of image frames in the query video sequence, wherein the reference edges includes 4 number of directional edges (fig. 2a-d; "[s]emantics at table 1") and a non-directional edge (fig. 2e);

b) extracting a plurality of image descriptors ("edge histogram descriptor" at s. 1, p. 51) for video sequences based on digital video data information from the database, wherein each image descriptor for said each video sequence includes L number of representative edge

histogram bins ("five histogram bins for each sub-image" at s. 2.3, p. 52; "80 histogram bins" at s. 1, p. 51; table 1) for said each video sequence;

c) comparing the image descriptor ("edge histogram descriptor" at s. 1, p. 51) for the query video sequence ("query images" at s. 5, p. 53) to said each image descriptor ("edge histogram descriptor" at s. 2.2, p. 52) for each video sequences ("MPEG-7" at s. 5, p. 53) to generate a comparison result ("[t]hen, the global, semi-global, and local histograms of two images are compared to evaluate the similarity measure" at abstract); and

d) retrieving at least one video sequence similar to the query video sequence based on the comparison results (fig. 8-9; table 2 retrieves at least one video sequence as shown).

Regarding **claim 22**, *Park et al.* discloses the method as recited in claim 21, wherein said each edge histogram has 5 number of edge histogram bins (e.g., Local-Edge[0] though Local-Edge[4] at table 1) corresponding to the reference edges (the reference edges given in Local-Edge[0] though Local-Edge[4] at table 1; e.g., Vertical edge of sub-image at (0,0)).

Regarding **claim 23**, *Park et al.* discloses wherein the directional edges (fig. 2a-d; "[s]emantics at table 1") include a vertical edge, a horizontal edge, a 45 degree edge, a 135 degree edge and the non-directional edge (*see* "[s]emantics at table 1" for all 5 categories) represents an edge of undesignated direction except for the 4 directional edges.

Regarding **claim 24**, *Park et al.* discloses method as recited in claim 21, wherein the step a) includes steps of:

a1) partitioning each image frame of query video sequence into L number of sub images (e.g., "4 x 4 = 16 sub-images" at s. 2.3, p. 52 wherein 16 = L), wherein each sub-image is further partitioned into S x T number of image-blocks (s. 3, p. 52; e.g., "image-block" at fig. 3), L, S and T being positive integers;

a2) assigning one of 5 number of reference edges (one of the five is selected; "for each sub-image, we generate an edge histogram" at s. 2.1, p. 51) to each image-block (s. 3, p. 52; e.g., "image-block" at fig. 3) to thereby generate L number of edge histograms ("edge histogram" at s. 2.3, p. 52) for each image frame, wherein the edge histograms include the M edge histogram bins (e.g., "16x5=80 bins for the edge histogram" at s. 2.3, p. 52) and the reference edges include 4 number of directional edges and a non-directional edge;

a3) normalizing the edge histogram bins ("normalize each bin in the histogram" at s. 2.4) contained in each edge histogram by S x T to thereby generate M number of normalized edge histogram bins ("five histogram bins for each sub-image" at s. 2.3, p. 52; "80 histogram bins" at s. 1, p. 51; table 1) for said each image frame;

a4) calculating M representative edge histogram bins (e.g., first five semantics in table 1) of said query video sequence in order to generate L number of representative edge histograms (edge histogram" at s. 2.2, p. 52) of each video sequence based on the normalized edge histogram bins ("five histogram bins for each sub-image" at s. 2.3, p. 52; "80 histogram bins" at s. 1, p. 51; table 1) of said each image frames

Claim Rejections - 35 U.S.C. § 103

[15] The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

<u>*Park et al. in view of Won et al.*</u>

[16] **Claims 25-38** are rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination between *Park et al.* in view of <u>Efficient Use of MPEG-7 Edge Histogram Descriptor</u>, vol. 24, no. 1, 2/2002 (hereinafter "Won et al.").

Regarding **claim 25**, *Park et al.* does not disclose wherein the step a2) includes the steps of: a2-1) assigning one of the reference edges to each image block; and a2-2) counting the number of each reference edge included in each sub-image to generate the L number of the edge histograms for the query video sequence.

Won et al. teaches wherein a step a2) includes the steps of:

a2-1) assigning one of the reference edges to each image block ("each image block is classified into one of thee 5 types of edge blocks or a nonedge block" at s. II, p. 25); and a2-2) counting the number of each reference edge included in each sub-image ("[w]ithin each sub-image the edge types are arranged in the following order. . ." at s. II, p. 24) to generate the L

number of the edge histograms (e.g., L being 80 / 5 = 16 edge histograms as calculated from table 1) for the query video sequence.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the step a2) of *Park et al.* to include the steps of: a2-1) assigning one of the reference edges to each image block; and a2-2) counting the number of each reference edge included in each sub-image to generate the L number of the edge histograms for the query video sequence as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23)

Regarding **claim 26**, *Park et al.* in view of *Won et al.* does not disclose wherein the step a2-1) includes the steps of: a2-11) dividing each image-block into 2.times.2 sub-blocks; a2-12) assigning a corresponding filter coefficient to each sub-block; a2-13) calculating a set of 5 edge magnitudes corresponding to five edges for each image-block by using the filter coefficient; and a2-14) expressing the image-block as an edge having a maximum edge magnitude by comparing the calculated edge magnitudes each other.

Won et al. teaches wherein a step a2-1) includes the steps of:

a2-11) dividing each image-block into 2.times.2 sub-blocks (fig. 5);

a2-12) assigning a corresponding filter coefficient (fig. 6a-e) to each sub-block;

a2-13) calculating a set of 5 edge magnitudes ("edge magnitudes. . ." at s. III, p. 25) corresponding to five edges for each image-block by using the filter coefficient (fig. 6a-e); and

a2-14) expressing the image-block (fig. 5 image block) as an edge having a maximum edge magnitude by comparing the calculated edge magnitudes each other ("maximum value among 5 edge strengths. . ." at s. III, p. 26; equation (6) at . 26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the step a2-1) of *Park et al.* in view of *Won et al.* to include the steps of: a2-11) dividing each image-block into 2.times.2 sub-blocks; a2-12) assigning a corresponding filter coefficient to each sub-block; a2-13) calculating a set of 5 edge magnitudes corresponding to

five edges for each image-block by using the filter coefficient; and a2-14) expressing the image-block as an edge having a maximum edge magnitude by comparing the calculated edge magnitudes each other as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23)

Regarding **claim 27**, *Park et al.* in view of *Won et al.* does not disclose wherein the 5 edge magnitudes are obtained by using 5 number of equations, which are expressed as:

$$m_v(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_v(k) \right|;$$

$$m_h(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_h(k) \right|;$$

$$m_{d-45}(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_{d-45}(k) \right|;$$

$$m_{d-135}(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_{d-135}(k) \right|; \text{ and}$$

$$m_{nd}(i,j) = \left| \sum_{k=0}^{3} a_k(i,j) \times f_{nd}(k) \right|, \text{ where } m_v(i,j),\ m_h(i,j),\ m_{d-45}(i,j),$$

respectively, respectively, denote vertical, horizontal, 45 degree, 135 degree and non-directional edge magnitudes for a $(i,j)^{th}$ image-block; $a_k(i,j)$ denotes an average gray level for a sub-block assigned k in the $(i,j)^{th}$ image-block and $f_v(k)$, $f_h(k)$, $f_{d-45}(k)$, $f_{d-135}(k)$ and $f_{nd}(k)$ denote, respectively, filter coefficients for the vertical, horizontal, 45 degree, 135 degree and non-directional edges where k represents a number assigned to each sub-block.

Won et al. teaches wherein the 5 edge magnitude are obtained by using 5 number of equations, which are expressed as:

$$m_v(i,j)=\left|\sum_{k=0}^{3}a_k(i,j)\times f_v(k)\right|;$$

$$m_h(i,j)=\left|\sum_{k=0}^{3}a_k(i,j)\times f_h(k)\right|;$$

$$m_{d-45}(i,j)=\left|\sum_{k=0}^{3}a_k(i,j)\times f_{d-45}(k)\right|;$$

$$m_{d-135}(i,j)=\left|\sum_{k=0}^{3}a_k(i,j)\times f_{d-135}(k)\right|;\ \text{and}$$

$$m_{nd}(i,j)=\left|\sum_{k=0}^{3}a_k(i,j)\times f_{nd}(k)\right|,\ \text{where}\ m_v(i,j),\ m_h(i,j),\ m_{d-45}(i,j),$$

(equations (1)-(5) at p. 26) respectively, respectively, denote vertical, horizontal, 45 degree, 135 degree and non-directional edge magnitudes for a $(i,j)^{th}$ image-block; $a_k(i,j)$ denotes an average gray level for a sub-block assigned k in the $(i,j)^{th}$ image-block and $f_v(k)$, $f_h(k)$, $f_{d-45}(k)$, $f_{d-135}(k)$ and $f_{nd}(k)$ denote, respectively, filter coefficients for the vertical, horizontal, 45 degree, 135 degree and non-directional edges where k represents a number assigned to each sub-block (last paragraph on p. 25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the 5 edge magnitudes of *Park et al.* in view of *Won et al.* to be are obtained by using 5 number of equations, which are expressed as:

$$m_v(i,j)=\left|\sum_{k=0}^{3}a_k(i,j)\times f_v(k)\right|;$$

$$m_h(i,j)=\left|\sum_{k=0}^{3}a_k(i,j)\times f_h(k)\right|;$$

$$m_{d-45}(i,j)=\left|\sum_{k=0}^{3}a_k(i,j)\times f_{d-45}(k)\right|;$$

$$m_{d-135}(i,j)=\left|\sum_{k=0}^{3}a_k(i,j)\times f_{d-135}(k)\right|;\ \text{and}$$

$$m_{nd}(i,j)=\left|\sum_{k=0}^{3}a_k(i,j)\times f_{nd}(k)\right|,\ \text{where}\ m_v(i,j),\ m_h(i,j),\ m_{d-45}(i,j),$$

respectively, respectively, denote vertical, horizontal, 45 degree, 135 degree and non-directional edge magnitudes for a $(i,j)^{th}$ image-block; $a_k(i,j)$ denotes an average gray level for a sub-block assigned k in the $(i,j)^{th}$ image-block and $f_v(k)$, $f_h(k)$, $f_{d-45}(k)$, $f_{d-135}(k)$ and $f_{nd}(k)$ denote, respectively, filter coefficients for the vertical, horizontal, 45 degree, 135 degree and non-

directional edges where k represents a number assigned to each sub-block as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23)

Regarding **claim 28**, *Park et al.* in view of *Won et al.* does not disclose wherein the maximum edge magnitude is greater than a predetermined threshold value, otherwise the image block is considered to contain no edge.

Won et al. teaches wherein the maximum edge magnitude is greater than a predetermined threshold value, otherwise the image block is considered to contain no edge ("if the maximum. . .then the image-block is considered. . .[o]therwise, the image-block contains no edge" at p. 26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the method of *Park et al.* in view of *Won et al.* to include wherein the maximum edge magnitude is greater than a predetermined threshold value, otherwise the image block is considered to contain no edge as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23)

Regarding **claim 29**, *Park et al.* does not disclose wherein the image descriptors for the query and target video sequence further include a global edge histogram and R number of the semi-global histograms based on the L 5 number of representative edge histogram bins, respectively, R being a positive integer.

Won et al. teaches wherein the image descriptors ("MPEG-7 standard descriptor" at s. II, p. 24) for the query and target video sequence ("ground truth images for each query image" at s. IV, p. 27; e.g., fig. 10 query and target video sequences) further include a global edge histogram ("global edge histogram" at s. IV, p. 27) and R number of the semi-global histograms based on the L x 5 number of representative edge histogram bins ("the global edge histogram has 5 bins

and each bin value is obtained by . . .bin values of the corresponding edge type of BinCounts[]" at s. IV, p. 27), respectively, R being a positive integer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the image descriptors for the query and target video sequence of *Park et al.* to further include a global edge histogram and R number of the semi-global histograms based on the L 5 number of representative edge histogram bins, respectively, R being a positive integer as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23)

Regarding **claim 30**, *Park et al.* in view of *Won et al.* does not disclose wherein the global edge histogram represents an edge distribution in a whole space of the query and target video sequences and each semi-global edge histogram represents an edge distribution in a corresponding set of sub-images of the query and target video sequences.

Won et al. teaches wherein the global edge histogram ("semi-global edge histograms" at pp. 26-27) represents an edge distribution in a whole space of the query and target video sequences (("edge distribution information for the whole image space and. . ." at pp. 26-27) and each semi-global edge histogram ("semi-global edge histograms" at pp. 26-27) represents an edge distribution ("represents the edge distribution for the whole image space" at p. 27) in a corresponding set of sub-images (e.g., sub-images at fig. 8) of the query and target video sequences.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the global edge histogram of *Park et al.* in view of *Won et al.* to include an edge distribution in a whole space of the query and target video sequences and each semi-global edge histogram represents an edge distribution in a corresponding set of sub-images of the query and target video sequences as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-

global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23)

Regarding **claim 31**, *Park et al.* in view of *Won et al.* does not disclose wherein said N and R are 4 and 13, respectively.

Won et al. teaches wherein N and R are 4 (each segment for semi-global histograms has four sub-images as shown in fig. 8; 4 sub-blocks at fig. 5) and 13 ("13 different subsets of the image-blocks" at p. 27; fig. 8), respectively.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the method of *Park et al.* in view of *Won et al.* to include wherein said N and R are 4 and 13, respectively as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23).

Regarding **claim 32**, *Park et al.* in view of *Won et al.* does not disclose wherein each of the 13 semi-global edge histograms is generated for each of 13 sets of 4 sub-images, wherein the 13 sets include: four sets of 4 sub-images, each set including 4 sub-images in each of first to fourth columns of the image in vertical direction; four sets of 4 sub-images, each set including 4 sub-images in each of first to fourth rows in horizontal direction; four sets of 4 sub-images, each set including a corresponding sub-image and 3 sub-images neighboring the corresponding sub-image, wherein the corresponding sub-image is respectively located on the left-top, on the right-top, on the left-bottom and on the right-bottom of the image; and a set including 4 sub-images around the center of the image.

Won et al. teaches wherein each of the 13 semi-global edge histograms (the 13 shown in fig. 8) is generated for each of 13 sets of 4 sub-images (each segment for semi-global histograms has four sub-images), wherein the 13 sets include:

four sets of 4 sub-images, each set including 4 sub-images in each of first to fourth columns of the image in vertical direction (left-most figure at fig. 8);

four sets of 4 sub-images, each set including 4 sub-images in each of first to fourth rows in horizontal direction (middle figure at fig. 8);

four sets of 4 sub-images, each set including a corresponding sub-image and 3 sub-images neighboring the corresponding sub-image, wherein the corresponding sub-image is respectively located on the left-top, on the right-top, on the left-bottom and on the right-bottom of the image; and a set including 4 sub-images around the center of the image (right-most figure at fig. 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the method of *Park et al.* in view of *Won et al.* to include wherein each of the 13 semi-global edge histograms is generated for each of 13 sets of 4 sub-images, wherein the 13 sets include: four sets of 4 sub-images, each set including 4 sub-images in each of first to fourth columns of the image in vertical direction; four sets of 4 sub-images, each set including 4 sub-images in each of first to fourth rows in horizontal direction; four sets of 4 sub-images, each set including a corresponding sub-image and 3 sub-images neighboring the corresponding sub-image, wherein the corresponding sub-image is respectively located on the left-top, on the right-top, on the left-bottom and on the right-bottom of the image; and a set including 4 sub-images around the center of the image as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23).

Regarding **claim 33**, *Park et al.* does not disclose wherein the step b) includes the steps of: b1) retrieving L x 5 number of quantization index values for each of the target video sequence; b2) converting each of the L x 5 number of quantization index values into L x 5 number of representative edge histogram bins for said each target vides sequence by using 5 number of non-linear inverse quantization tables; and b3) generating L number of representative edge histograms based on the L x 5 number of normalized edge histogram bins.

Won et al. teaches wherein the step b) includes the steps of:

b1) retrieving L x 5 number of quantization index values (table 1 lists 13 x 5, the semantics being the quantization index values) for each of the target video sequence ('images or video" at abstract, p. 23);

b2) converting each of the L x 5 number of quantization index values into L x 5 number of representative edge histogram bins (histogram bins listed in table 1) for said each target vides sequence by using 5 number of non-linear inverse quantization tables ("[t]he normalized 80 bin values are nonlinearly quantized and fixed length coded with 3birts/bin as defined in Table 2. . ." at p. 25); and

b3) generating L number of representative edge histograms (e.g., table 3 generates the L number based on the edge histogram bins) based on the L x 5 number of normalized edge histogram bins.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the method of *Park et al.* to include wherein the step b) includes the steps of: b1) retrieving L x 5 number of quantization index values for each of the target video sequence; b2) converting each of the L x 5 number of quantization index values into L x 5 number of representative edge histogram bins for said each target vides sequence by using 5 number of non-linear inverse quantization tables; and b3) generating L number of representative edge histograms based on the L x 5 number of normalized edge histogram bins as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23).

Regarding **claim 34**, *Park et al.* in view of *Won et al.* does not disclose wherein the step b) further includes the step of: b4) further generating a global edge histogram and R number of semi-global histograms for each of the target video sequence based on the L x 5 number of representative edge histogram bins.

Won et al. teaches wherein the step b) further includes the step of:

b4) further generating a global edge histogram ("global edge histogram" at p. 27) and R number of semi-global histograms (e.g., "semi-global edge histograms of image A and image B,

respectively" at p. 27) for each of the target video sequence based on the L x 5 number of representative edge histogram bins (equation (7) at p .27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the step b) of *Park et al.* in view of *Won et al.* to include the step of: b4) further generating a global edge histogram and R number of semi-global histograms for each of the target video sequence based on the L x 5 number of representative edge histogram bins as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23).

Regarding **claim 37**, *Park et al.* in view of *Won et al.* does not disclose wherein the step c) includes the step of: estimating a distance between the query video sequence and said each target video sequence by equation as:

$$Distance(A,B) = \sum_{i=0}^{79} | Local\_A[i] - Local\_B[i] | + 5 \times \sum_{i=0}^{4} | Global\_A[i] - Global\_B[i] |$$
$$+ \sum_{i=0}^{64} | Semi\_Global\_A[i] - Semi\_Global\_B[i] |$$

where Local_A[i] and Local_B[i] denote, respectively, the edge histogram bins of BinCount[i] of the query video sequence A and the target video sequence B; Global_A[ ] and Global_B[ ] denote, respectively, the edge histogram bins for the global edge histograms of the query image A and the target image B; and Semi_Global_A[ ] and Semi_Global_B[ ] denote, respectively, the histogram bin values for the semi-global edge histogram bins of the query video sequence A and the target video sequence B.

Won et al. teaches wherein the step c) includes the step of:

estimating a distance between the query video sequence and said each target video sequence by equation as:

$$Dis\tan ce(A,B) = \sum_{i=0}^{79} | Local\_A[i] - Local\_B[i] | + 5 \times \sum_{i=0}^{4} | Global\_A[i] - Global\_B[i] |$$
$$+ \sum_{i=0}^{64} | Semi\_Global\_A[i] - Semi\_Global\_B[i] |$$

where Local_A[i] and Local_B[i] denote, respectively, the edge histogram bins of BinCount[i] of the query video sequence A and the target video sequence B; Global_A[ ] and Global_B[ ] denote, respectively, the edge histogram bins for the global edge histograms of the query image A and the target image B; and Semi_Global_A[ ] and Semi_Global_B[ ] denote, respectively, the histogram bin values for the semi-global edge histogram (p. 27, left column; equation (7), p. 27)

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the step c) of *Park et al.* in view of *Won et al.* to include the step of: estimating a distance between the query video sequence and said each target video sequence by equation as:

$$Dis\tan ce(A,B) = \sum_{i=0}^{79} | Local\_A[i] - Local\_B[i] | + 5 \times \sum_{i=0}^{4} | Global\_A[i] - Global\_B[i] |$$
$$+ \sum_{i=0}^{64} | Semi\_Global\_A[i] - Semi\_Global\_B[i] |$$

where Local_A[i] and Local_B[i] denote, respectively, the edge histogram bins of BinCount[i] of the query video sequence A and the target video sequence B; Global_A[ ] and Global_B[ ] denote, respectively, the edge histogram bins for the global edge histograms of the query image A and the target image B; and Semi_Global_A[ ] and Semi_Global_B[ ] denote, respectively, the histogram bin values for the semi-global edge histogram bins of the query video sequence A and the target video sequence B as taught by *Won et al.* since "using the local histogram bins only may not be sufficient to represent global features of the edge distribution. Thus, to improve the retrieval performance, we need global edge distribution as well. This paper describes how to generate the semi-global and global edge histograms from the local histogram bins. Then, the global, semi-global, and local histogram bins are used to evaluate the similarity between images. " (*Won et al.* at s. I, P. 23).

Regarding **claim 35**, claim 33 recites identical features as in claim 35. Thus, references/arguments equivalent to those presented above for claim 33 are equally applicable to claim 35.

Regarding **claim 36**, claim 34 recites identical features as in claim 36. Thus, references/arguments equivalent to those presented above for claim 34 are equally applicable to claim 36.

Regarding **claim 38**, claim 37 recites identical features as in claim 38. Thus, references/arguments equivalent to those presented above for claim 37 are equally applicable to claim 38.

Conclusion

[17] The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 20020136454 A1; US 6807298 B1.

[18] Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID P. RASHID whose telephone number is (571)270-1578 and fax number (571)270-2578. The examiner can normally be reached Monday - Friday 7:30 - 17:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-74155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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